

a relatively high resistance as compared with that of the albuminous fluid filling the remainder of the space. It has been sometimes suggested that alterations of resistance may play an important part in the phenomena of organ activity. The experiments just given appear to indicate that the discs have a resistance which is of a different order to that of the physiological saline in the surrounding media; but even in the case of these protoplasmic structures the results scarcely warrant the belief that there is anything exceptional in their higher resistance since it only places them in the same category with such other excitable tissues as muscle and nerve, which have been shown to offer a greater electrical resistance in the transverse than in the longitudinal direction.

On the Formation of the Pelvic Plexus, with especial Reference to the Nervus Collector, in the Genus *Mustelus*." By R. C. PUNNETT, B.A., Scholar of Gonville and Caius College, Cambridge. Communicated by HANS GADOW, F.R.S. Received June 30,—Read November 16, 1899.

(Abstract.)

The main object of this investigation was to ascertain whether at any period in the development of the animal selected, the number of branches composing the *nervus collector* was greater than that found in the adult. As a logical consequence of Gegenbaur's theory we should expect such to be the case, and the ontogenetic history of the *nervus collector* recorded in this paper, its maximum development in young embryos, and its subsequent gradual decrease through the later stages of embryonic existence leading to its condition in the adult, must, if there is any truth in the recapitulation theory, all point to its primitive character.

The history of the posterior collector, the very existence of which has not hitherto been described, throws important light upon the theory mentioned above. Here we have a collector formed in the embryo, from which in later stages the component nerves separate and run singly into the fin. Such a fact points very strongly to the collector condition being more primitive than that condition in which the nerves reach it without previously effecting any junction with one another.

It is further shown that the formation of this collector is due to migration of the whole fin rostrally, and not merely to a contraction of the fin area, and in support of this the following evidence is brought forward. The two species, *M. laevis* and *M. vulgaris*, differ from one another chiefly in the more rostral position of the pelvic girdle in the former. That it is highly improbable such a condition should be due

to excalation of vertebræ between the pelvis and head region of *M. levis* is shown in such facts as the following :—

- (a) The great amount of both excalation and intercalation which must be going on in different regions of the animal on such a hypothesis.
- (b) In some cases the girdle-piercing nerve may pass partly over and partly through the girdle, not showing that rigidity which on the excalation theory we should be led to expect.
- (c) The serial number of the girdle-piercing nerve may be different on the two sides of the same individual.

On the hypothesis of migration such facts receive an easy explanation, which is also in accordance with the existence of a greater caudal extension of the area of innervation of the pelvic fin in the males of *M. levis* than the females, and in the great amount of variability in *M. levis*, which species we suppose to have been derived from a more stable form such as *M. vulgaris* by a rostral migration of the pelvic girdle.

Hence migration being rendered very probable on other grounds, the posterior collector must be supposed to be formed as a direct result of that migration, and its undoubted connection with the shifting of the fin along the vertebral column is of great importance in explaining the formation of the anterior *nervus collector*.

“On the Least Potential Difference required to produce Discharge through various Gases.” By the Hon. R. J. STRUTT, B.A., Scholar of Trinity College, Cambridge. Communicated by LORD RAYLEIGH, F.R.S. Received October 17,—Read November 16, 1899.

(Abstract.)

The investigation, of which an account is given in this paper, deals with the potential difference required to produce sparks in various gases, between large parallel planes at a fixed distance apart, and at various pressures.

It was found by Mr. Peace* that the striking potential between two parallel plates in air diminished as the pressure diminished, till a certain point was reached, and then began to rise very rapidly. The pressure at which the striking potential was a minimum, depended on the distance between the plates, and increased as the distance was lessened. The minimum potential itself, however, varied very little with the distance between the plates.

This minimum potential was of the same order as the cathode fall

* ‘Roy. Soc. Proc.,’ vol. 52, p. 99.